

101404

Tyler Refrigeration Pit Site
Smyrna, Delaware

RECORD OF DECISION



PREPARED BY
THE U.S. ENVIRONMENTAL PROTECTION AGENCY

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STATE LETTER OF CONCURRENCE

ADMINISTRATIVE RECORD INDEX

RECORD OF DECISION
TYLER REFRIGERATION PIT SITE

DECLARATION

SITE NAME AND LOCATION

Tyler Refrigeration Pit Site
Smyrna, Delaware

STATEMENT OF BASIS AND PURPOSE

This decision document presents the Environmental Protection Agency's selected remedial action for the Tyler Refrigeration Pit Site (Site) in Smyrna, Delaware which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis for selecting the remedy for this Site. The information supporting this remedial action decision is contained in the Administrative Record for this Site.

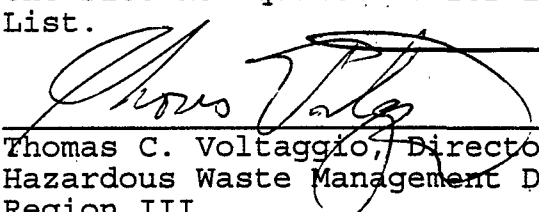
The Delaware Department of Natural Resources and Environmental Control (DNREC) has concurred with the selected no action remedy (see attached letter).

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy for the Tyler Refrigeration Pit Site is No Action. Ground water monitoring shall be conducted to ensure the protectiveness of the no action remedy in the future. A review of the conditions at the Site will be conducted within five years, in accordance with Section 121(c) of CERCLA, 42 U.S.C. §9621(c), and 40 C.F.R. Section 300.430(f)(4)(ii) of the NCP, to verify that no unacceptable hazards are posed by conditions which then exist at the Site.

DECLARATION STATEMENT

EPA has determined that no remedial action is necessary at the Site to ensure protection of human health and the environment. Since EPA's future response at this Site does not require physical construction, the Site now qualifies for inclusion on the Construction Completion List.



Thomas C. Voltaggio, Director
Hazardous Waste Management Division
Region III

5/10/78

Date

AR303505

DECISION SUMMARY

1. Site Name, Location and Description

The Tyler Refrigeration Pit Site (Site) is located on a 3-acre parcel of property at 655 Glenwood Avenue, Smyrna, Delaware. This property is currently owned by the State of Delaware and occupied by the Metal Masters Food Service Equipment Company, Inc. (Metal Masters), but was formerly owned by the Tyler Refrigeration Corporation and the Clark Equipment Company. The Site is approximately 1/2 miles southwest of the center of the town of Smyrna (Figure 1).

The Site includes an area which formerly contained two wastewater lagoons in the northeast portion of the property (Figure 2). Based on aerial photographs, the two lagoons are approximately 70 feet x 70 feet and 60 feet x 60 feet and existed on the property from as early as 1954. The lagoons received wastewater from manufacturing operations at the property. Sometime between 1973 and 1975, Clark Equipment Company excavated and removed the contents of the lagoons. The lagoons were then backfilled and regraded and are currently maintained as parts of a lawn and an asphalt parking lot.

The land use in the area surrounding the Site is predominantly residential with some light industry and farming. Properties to the north of the Site across Glenwood Avenue include commercial properties, several residences and agricultural lands. To the west-northwest of the Site are several residences along Glenwood Avenue. To the south and southwest of the lagoons is the Metal Masters building and property and a grain elevator/silo structure. The area to the south-southeast of the Site is mainly residential. Surface water bodies in the general area include Greens Branch, Duck Creek, Lake Como and Mill Creek. The potable water supplies in the vicinity of the Site are obtained entirely from ground water and are provided primarily through municipal well systems.

2. Site History and Enforcement Activities

In the late 1940s, a plant was constructed on the property to manufacture refrigerators by Wilson Refrigeration, Inc. Prior to this time the property was owned by the John E. Wilson, Jr. and Bertha M. Wilson and Wilson Cabinet Company. In 1951, Tyler Refrigeration Corporation (Tyler) leased the property from the Wilsons until 1956 when the title of the property was passed to Tyler. Based on existing aerial photographs, the two lagoons were constructed in the northeast portion of the property sometime prior to 1954. These lagoons were apparently constructed to receive wastewater from the refrigeration manufacturing operations at the Site, although little information

is available as to their operation. The wastewater reportedly contained paints, paint-related waste, and solvents including trichloroethylene (TCE). In 1963, Tyler became part of the refrigeration division of Clark Equipment Company (Clark). Clark manufactured refrigeration equipment at the property until 1976. Wastewater discharges from the manufacturing operation were connected to a municipal sewage system in 1969. Sometime between 1973 and 1975, Clark excavated and removed the contents of the lagoons, and then backfilled the lagoons. In 1978, the Metal Masters Food Service Equipment Co. (Metal Masters) took possession of the property. At approximately the same time, pursuant to a financing arrangement in connection with this transaction, the Delaware Department of Community Affairs and Economic Development took title to the property.

In 1977, during routine monitoring, the Town of Smyrna's two municipal water supply wells were found to contain trichloroethene (TCE). Investigations by the Delaware Department of Natural Resources and Environmental Control (DNREC), the Delaware Division of Public Health and the Town of Smyrna identified a number of potential sources of TCE in the Smyrna area, including the Site. In 1982, Smyrna installed Granular Activated Carbon (GAC) units on its two municipal water supply wells. The GAC units effectively reduced TCE concentrations in the drinking water supplies to safe levels.

The EPA, in 1982, performed a Preliminary Assessment/Site Inspection at the Site. Low levels of trichloroethane (TCA) and dichloroethane (DCA) were detected in one soil sample and toluene was detected in another soil sample. In December 1983, DNREC performed a Preliminary Site Assessment and concluded that TCE concentrations in the Smyrna wells appeared to be decreasing.

In June 1985, EPA reviewed the available information for the Site and concluded that it was one of several possible sources of the TCE found in the Smyrna municipal wells. On May 7, 1986, EPA collected a total of 10 ground water samples from domestic wells in the vicinity of the Site. The samples were analyzed for volatile organic compounds (VOCs). The only VOCs detected were low levels of chloroform in two of the samples.

On June 10, 1986, the EPA formally proposed adding the Site to the National Priorities List (NPL). Significant comments were then submitted to EPA regarding the Hazard Ranking System (HRS) score (29.41) and opposing the inclusion of the Site onto the NPL. As a result, EPA commissioned DNREC to perform a follow-up inspection of the Site. Under this investigation, DNREC installed and sampled six (6) monitoring wells located across Glenwood Avenue from the Site. Based on the ground water sampling results, three substances of concern were identified in connection with the Site: 1,1,1-TCA, 1,1-dichloroethene (1,1-DCE) and chromium. Using the ground water sampling data collected by

DNREC, EPA revised the HRS score for the Site in 1989, increasing the score to 33.94. The Site was formally added to the NPL on February 20, 1990.

In March 1991, EPA and Clark, the previous owner and operator at the Site, entered into a Administrative Order on Consent whereby Clark agreed to perform a Remedial Investigation (RI) and Feasibility Study at the Site.

In the spring of 1995, Metal Masters ceased operations and the property is currently for sale.

3. Highlights of Community Participation

In October 1993, EPA issued a fact sheet to the public and on November 10, 1993, held a public meeting to discuss the findings of the RI performed by Clark which concluded that the lagoons were not the primary source of the ground water contamination. During the public meeting, EPA and DNREC explained that DNREC would conduct a separate RI under the Delaware Hazardous Substance Control Act (HSCA) for the adjacent Metal Master's plant area which was suspected to be the primary source of the ground water contamination. During this time, the RI Report prepared by Clark was placed in the Administrative Record for public review.

In September 1995, following completion of an RI performed by Metal Masters for the adjacent Metal Masters' plant area, DNREC solicited public comment on its finding that no action was necessary to protect human health and the environment. No comments were received from the public. In October 1995, DNREC issued its no action decision in a Final Proposed Plan of Remedial Action.

EPA released its Proposed Plan for the Tyler Refrigeration Pit Site to the public for comment on February 21, 1996. In accordance with Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, EPA made this document available to the public in the Administrative Record maintained at the EPA Docket Room in Region III, and in the Smyrna Public Library in Smyrna, Delaware. The notice of availability of this document was published in the Smyrna-Clayton Sun Times and the Wilmington News Journal on February 21, 1996. A public comment period on the documents was held from February 21, 1996 to March 22, 1996. A response to the comments received during this period is included in the Responsiveness Summary, which is part of this Record of Decision (ROD).

4. Scope and Role of the Response Action Within Site Strategy

EPA has determined that the Site does not pose an unacceptable threat to human health and the environment and that no remedial action is required. The only environmental medium of concern at the Site is the ground water. Because the ground water in the immediate vicinity of the Site is not used as a potable water source, there are no current risks associated with the Site. The risks calculated under a future use scenario (see Section 7) are slightly above EPA's generally acceptable risk range. However, the State has instituted a Ground Water Management Zone (GMZ) which prohibits well installation on the entire Metal Masters' property (see Figure 3). The GMZ will provide continued assurance that there is no direct contact with any contaminated ground water inside the property boundaries. In addition, an EPA-approved ground water monitoring program shall be implemented to determine whether contaminants are migrating off-site at levels which would cause a future threat to human health and the environment, and, hence, require actions to abate such a threat.

5. Summary of Site Characteristics

Geology: The Site lies within the Atlantic Coastal Plain physiographic province. The sedimentary beds of this province dip gently to the southeast and consist of a wedge of sedimentary deposits thickening down-dip. The sedimentary wedge is approximately 2200 feet thick in northwest Kent County. Directly underlying the Site are sediments of the Pleistocene-aged Columbia Formation. The Columbia Formation sediments in the vicinity of the Site are comprised of light brown to orange brown colored coarse to fine grained sand with some gravel and gravel layers. Underlying the Columbia Formation beneath the Site are the Miocene age sediments of the Chesapeake Group which consist of dark gray silty clay.

The Columbia Formation sediments underlying the Site form a productive regional water table aquifer. The Chesapeake Group sediments form a confining layer beneath the water table aquifer. Potable water supplies in the vicinity of the Site are obtained from ground water and are provided primarily through municipal water systems. The Town of Smyrna operates two public water supply wells. Well numbers 1 and 2 are 1600 feet and 4600 feet east of the Site, respectively. The town of Clayton operates three public water supply wells. The closest of these wells, Well number 3, is located approximately 3300 feet southwest of the Site. All three of the Clayton wells are located in the upgradient ground water flow direction from the Site. The Smyrna municipal wells draw water from the Columbia Formation aquifer while the Clayton municipal wells draw water from the deeper Rancocas aquifer. In the Smyrna area, the Columbia and Rancocas aquifer are separated by the Calvert and Nanjemoy formations.

These formations are 200 feet thick in the Smyrna area and act as a confining unit above the Rancocas aquifer.

Based on the well inventory conducted during the RI, several wells in the Smyrna-Clayton area are classified as domestic water wells. However, none of these wells is located in a down gradient ground water flow direction from the Site.

Ground water flow direction in the Columbia Aquifer was determined based on a four-month water level study conducted during the RI. The ground water flow direction from the Site is generally to the northeast. An eight-day water level study conducted during the RI indicated that pumping at Smyrna Well No. 1 does not influence the water levels at the Site, although the Site may be within the capture zone of Smyrna Well No. 1 under steady-state, long-term conditions.

Surface Drainage: The topography at the Site is nearly level. The entire Site is at an elevation of approximately 40 feet above sea level. Surface drainage from the parking lot area at and adjacent to the Site is conveyed via storm drains to a shallow drainage ditch and retention basin, with no outlet, located east of the Site. The drainage ditch and retention basin were constructed by Metal Masters after the closure of the lagoons in conjunction with the construction of the parking lot. A scrub/shrub-emergent wetland area is located within the retention basin. Since this area is only intermittently saturated as a result of stormwater runoff from blacktop areas and building roofs, it is not considered to be a functional wetland.

Surface water bodies in the general area include Greens Branch, Duck Creek, Lake Como, and Mill Creek. Greens Branch is located approximately 1500 feet west of the Site and flows in a northeasterly direction into Duck Creek. Duck Creek is located approximately 4000 feet to the north of the Site and flows east to its confluence with the Smyrna River. The Smyrna River flows to the northeast and discharges to the Delaware Bay. Lake Como is located approximately 4000 feet to the southeast of the Site and is used for recreational purposes.

6. Nature and Extent of Contamination

Soil: Three distinct layers were encountered in the soil borings taken during the RI in the locations of the former lagoons: 1) a surficial material consisting predominantly of silty sand to sandy silt, probable backfill material; 2) a soft, dark gray colored silt to sandy silt material containing, some organic material. This most likely marks the bottom of the lagoons; and 3) native Columbia Formation sediments. Former Lagoon 1 is approximately 11.5 feet deep at its deepest point. The sandy silt material in Former Lagoon 1 is approximately 2 to 5.5 feet thick. In Former Lagoon 2, the sandy silt material is thinner

and less aerially extensive.

As part of the RI, surface soil samples were collected from nine (9) locations from the surface to a depth of one foot (see Figure 4). In general, the surface soil samples did not show the presence of elevated concentrations of contaminants of concern. No VOCs were detected in the surface soil samples other than methylene chloride, which is most likely an analytical laboratory contaminant, and no semivolatile organic compounds (SVOCs) were found. In addition, no inorganic substances were detected in any of the surface soil samples at concentrations significantly above background levels. One of the surface soil samples, however, contained several pesticides (0.93 ug/kg dieldrin, 0.49 ug/kg lindane, 0.57 ug/kg Heptachlor, 0.38 ug/kg DDE, 1.4 ug/kg DDT, and 0.91 ug/kg endrin). The presence of pesticides at this location may be attributable to the use of fill that was deposited on the property from a neighboring agricultural area. Several of the pesticides detected, including DDT, have been banned for as long as twenty years, indicating that the pesticides have resided in the soils for a considerable amount of time.

A total of 23 subsurface soil samples were collected from 10 soil borings to assess subsurface soil quality in the area within, adjacent to and below the former lagoons (see Figure 5). Volatile organic compounds were detected in 4 of the 23 subsurface soil samples analyzed. These compounds included acetone (10 to 46 ug/kg), xylene (6 to 950 ug/kg), carbon disulfide (8 ug/kg), 1,1,2-TCA (8 ug/kg), 2-butanone (22 ug/kg), and ethylbenzene (140 ug/kg). None of the VOCs of concern in the ground water (1,1-TCE, 1,1,1-TCA and 1,1-DCE) was detected. Semivolatile organic compounds were detected in 3 of the 23 samples. These compounds are 2-ethylhexyl phthalate (56 to 130 ug/kg) and diethyl phthalate (330 ug/kg). Pesticides were detected in 3 of the 23 samples including dieldrin (0.28 ug/kg), DDE (0.26 to 0.86 ug/kg), DDT (0.75 ug/kg), and DDD (0.38 ug/kg). Finally, chromium and zinc were detected at levels above background samples from 2 of the borings. Chromium concentrations ranged from 159 to 385 ug/kg and zinc concentrations ranged from 628 to 982 ug/kg.

Ground Water: Ground water samples were collected from 12 monitoring wells in the vicinity of the Site (see Figure 6 for locations). Volatile organic compounds were detected in 5 of the 12 wells sampled. The highest concentrations of VOCs were 1,1,1-TCA and 1,1-DCE which were detected in monitoring well S-1 at 720 ug/l and 33 ug/l, respectively. TCE was not detected in any of the ground water samples. In addition, no vinyl chloride was detected. Low levels of SVOCs were detected in samples from 5 of the 12 wells. Low levels of pesticides were also detected in samples from 5 of the 12 wells during the RI, including dieldrin, lindane, endrin ketone. Chromium was detected at levels above

background levels in four of the twelve wells. The highest total chromium concentration was detected at 87.2 ug/l. Zinc was not detected above background levels in any ground water samples collected.

Conclusions: The ground water and soils data presented in the RI indicate that the lagoons are not the primary source of the 1,1,1-TCA and the 1,1-DCE detected in monitoring well S-1. Neither of these contaminants were detected in any of the soils within or below the former lagoons. In addition, the pattern of contaminants detected in the ground water suggests the existence of a source unrelated to the Site and located south of the former lagoons and upgradient of well S-1. Finally, the increase in 1,1,1-TCA concentrations in the samples from well S-1 collected in 1988 and 1992 indicates that a release of 1,1,1-TCA may have recently occurred from a source upgradient of well S-1 or recently migrated from such an upgradient source. Since 1,1-DCE is a breakdown product of 1,1,1-TCA, the same source is most likely responsible for the presence of both contaminants.

These conclusions are further supported by the findings of the Metal Masters' Remedial Investigation¹ conducted pursuant to an order with DNREC. The Metal Masters' Remedial Investigation identified three possible source areas: 1) a loading dock where drums of TCA were received, 2) a TCA Storage Area and 3) an underground sanitary sewer holding tank (see Figure 7). Surface and subsurface soil samples were taken from these areas. Three additional monitoring wells were installed downgradient of these areas to study the ground water. The distribution of contamination in the soil and ground water indicated that the historic source of the 1,1,1-TCA and 1,1-DCE was near the TCA Storage Area (see Figures 8 and 9). The Metal Masters' Remedial Investigation concluded that the TCA Storage Area, however, does not likely represent a continuing potential source because little contamination remains in the soil and Metal Masters discontinued operations in Spring 1995.

7.0 Summary of Site Risks

7.1 Human Health Risk Assessment

The Baseline Risk Assessment (BLRA) for the Tyler Refrigeration Pit Site quantifies the potential human health risks associated with exposure to contaminated environmental media. The BLRA was prepared in conjunction with available EPA guidelines for conducting Superfund Risk Assessments and utilized the data collected during EPA's Remedial Investigation of the Site. The

¹ Metal Masters Food Services CO., Inc., Remedial Investigation Report (Groundwater Technology, June 1995)

risk assessment first evaluated and selected the contaminants of concern based on the following considerations: 1) site history and operations; 2) detected concentrations in excess of risk-based levels and 3) typical background concentrations of chemical constituents in the vicinity of the site or in unpolluted soils of the Eastern United States. The risk assessment then evaluated Site-related exposures to these chemicals. In the final step, the concentrations of the chemicals at the point of exposure were used to estimate the potential for an adverse effect on human health or the environment.

Contaminants of Concern: The three contaminants of concern that were evaluated in the risk assessment are 1,1,1-TCA , 1,1-DCE and a pesticide, dieldrin, all of which were detected in the ground water. In addition to exceeding health based levels, the 1,1,1-TCA and 1,1-DCE also exceeded their respective Maximum Contaminants Levels (MCLs) of 200 ppb and 7 ppb.

Exposure Assessment: Several environmental media at the Site were assessed for the presence of contamination including surface soil, subsurface soil gas and ground water. Based on the findings of the RI the only environmental medium of concern at the Site is ground water. Since potable water in the area of the Site is provided by municipal systems, it was not necessary to evaluate the current land-use scenario. However, under the future potential land-use scenario, theoretical exposure to residents, via contaminated private or municipal wells, was assessed. The primary routes of exposure to ground water at the Site under this scenario involve drinking (ingestion) by children and adults, breathing (inhalation) while showering by adults, and dermal (or skin) contact by children.

Since a different pattern of contamination was observed for dieldrin as compared to the 1,1,1-TCA and 1,1-DCE contamination, two separate well clusters were evaluated. Cluster A includes monitoring wells S-1 and S-6 which contained 1,1-DCE and 1,1,1-TCA in excess of health-based levels and Cluster B includes monitoring wells S-2, S-3, D-2 and D-4 which contained dieldrin in excess of health-based levels. The data used in the BLRA conforms to EPA guidance which recommends choosing monitoring wells located in the apparent center of the ground water plume, since it is conceivable that future potable wells may be developed in this area.

The exposure point concentrations used in the risk calculations are defined as the 95th percent upper confidence limit (UCL) value of the arithmetic mean of the data for the Site. In cases where the exposure point concentration value exceeds the maximum reported concentration for a given contaminant, or in cases where the data set is not sufficient for the calculation of an exposure point concentration, the maximum reported value is used for exposure point calculations. If a contaminant has been

determined to be present in samples for a given medium, but is reported as a non-detect for a given sample, one-half of the detection limit is used in the exposure point calculation for that contaminant. Table 1 provides the 95th UCL value for each contaminant of concern. In every instance, the 95th UCL exceeded the maximum observed concentration of ground water contaminants; therefore, the maximum detected concentration of each contaminant was used in the risk calculations.

Exposure parameters applied in the BLRA are presented in Table 2. These values reflect the default exposure parameters defined by EPA guidance².

Table 1: Statistical Analysis of Ground Water Data for Contaminants of Concern

Contaminant (ug/l)	Mean	95th% UCL	Maximum
1,1-DCE	12.00	3672.52	33.00
1,1,1-TCA	187.75	1.08E+14	720.00
Dieldrin	0.08	0.59	0.26

² Environmental Protection Agency. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03. March 25, 1991.

Table 2 - Exposure Assessment Parameters		
Exposure Factors	Future Child Resident	Future Adult Resident
INGESTION EXPOSURE PATHWAY - Ground Water		
<u>Ingestion Rate:</u>	1 liter/day	2 liter/day
<u>Exposure Frequency:</u>	350 days/year	350 days/year
INHALATION OF VAPORS WHILE SHOWERING EXPOSURE PATHWAY		
<u>Inhalation Rate:</u>	N/A	0.0138889 m ³ /min
<u>Shower Duration:</u>	N/A	12 min/day
<u>Exposure Frequency:</u>	N/A	350 days/year
DERMAL CONTACT WHILE BATHING EXPOSURE PATHWAY		
<u>Skin Surface Area Exposed:</u>	7200 cm ²	N/A
<u>Bath Duration:</u>	0.33 hours/day	N/A
<u>Permeability Constant:</u>	1.60 E-02 cm/hour (1,1-DCE) 1.70 E-02 cm/hour (1,1,1-TCA) 1.60 E-02 cm/hour (dieldrin)	N/A
<u>Exposure Frequency:</u>	350 days/yr	N/A
EXPOSURE ASSESSMENT CONSTANTS		
<u>Exposure Duration</u>	6 years	24 years
<u>Body Weight</u>	15 kg	70 kg
<u>Averaging Time:</u>		
Carcinogens	25550 days	25550 days
Noncarcinogens	2190 days	8760 days

Toxicity Assessment: Toxicity criteria for assessing potential carcinogenic risks and noncarcinogenic threats for the selected contaminants of concern are presented in Table 3.

The Carcinogenic Slope Factor is the plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. The Carcinogenic Slope Factor is used to estimate an upper-bound probability of an individual

developing cancer as a result of exposure to a particular level of a potentially carcinogenic contaminant of concern.

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals, that are not likely to result in an appreciable risk of adverse health effects. Estimated intakes of chemicals from environmental media (i.e., the amount of a chemical ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (i.e., to account for the use of animal data to predict effects on humans). These uncertainty factors help ensure that the RfDs will not underestimate the potential for adverse noncarcinogenic effects to occur.

In addition to providing toxicity criteria, Table 3 also provides the carcinogenic Weight of Evidence for each contaminant of concern.

Table 3: Toxicity Criteria and Carcinogenic Weight of Evidence

		Carcinogenic Slope Factor (mg/kg/day) ⁻¹		Reference Dose (mg/kg/day)	
Contaminant	Carcinogenic Weight of Evidence	Oral	Inhalation	Oral	Inhalation
1,1-DCE	C	6.00E-01	1.75E-01	9.00E-03	ND
1,1,1-TCA	D	N/A	N/A	9.00E-02	2.86E-01
Dieldrin	B2	1.60E+01	1.61E+01	5.00E-05	ND

C = Possible Human Carcinogen. Limited evidence in animals and/or carcinogenic properties in short-term studies.

D = Not Classified. Inadequate evidence in animals.

B2 = Possible Human Carcinogen. Sufficient evidence in animals, inadequate evidence in humans.

Risk Characterization: Exposure estimates and toxicity criteria for the contaminants of concern were combined to estimate potential carcinogenic risks and noncarcinogenic effects for the pathways and routes identified for the Site. These estimates characterize the potential for human health impacts associated with exposure to contaminated ground water.

The upper bound estimate of the carcinogenic risk is expressed in terms of the number of excess cancers over a lifetime in an exposed population under a specific exposure scenario. For instance, a carcinogenic risk of 1.0×10^{-6} is defined as 1 additional cancer per 1 million exposed individuals. In general, EPA defines incremental carcinogenic risk within the 1.0×10^{-6} to 1.0×10^{-4} range as being acceptable, with 1×10^{-6} being the point of departure or goal.

The numerical value used to evaluate noncarcinogenic risk is the Hazard Quotient (HQ). An HQ is the ratio between the dose of a single substance over a specified period of time to the RfD for that substance. The Hazard Index (HI) is the sum of more than one HQ for multiple substances or multiple exposure routes and pathways. When the HQ or the HI exceeds unity, there may be concern for potential noncancer health effects.

The carcinogenic risks and noncarcinogenic threats associated with exposure to contaminated ground water across all routes (ingestion, inhalation and dermal absorption) were summed, as appropriate, for each potential receptor. The cumulative risks and threats for child and adult receptors are presented in Tables 4 and 5, respectively. The combined carcinogenic risk and noncarcinogenic threats over a 30 year residential exposure duration (6 years as a child resident plus 24 years as an adult resident) are presented in Table 6.

TABLE 4: Cumulative Potential Carcinogenic Risk and Noncarcinogenic Threat - Child Resident - Ingestion of and Dermal Contact with Ground Water

Monitoring Well Clusters	Cumulative Carcinogenic Risk	Cumulative Noncarcinogenic Threat (Hazard Index)
S-1, S-6	1.12×10^{-4}	0.775
S-2, S-3, D-2, D-4	2.37×10^{-5}	0.345

* In monitoring wells S-1 and S-6, the cumulative carcinogenic risk is due to ingestion of and dermal contact with 1,1-DCE. The cumulative noncarcinogenic threat is due to ingestion of and dermal contact with 1,1-DCE and 1,1,1-TCA.

* In monitoring wells S-2, S-3, D-2 and D-4, the cumulative carcinogenic risk is due to ingestion of and dermal contact with dieldrin. The noncarcinogenic threat is due to ingestion of and dermal contact with dieldrin.

TABLE 5: Cumulative Potential Carcinogenic Risk and Noncarcinogenic Threat - Adult Resident - Ingestion and Inhalation of Ground Water

Monitoring Well Clusters	Cumulative Carcinogenic Risk	Cumulative Noncarcinogenic Threat (Hazard Index)
S-1, S-6	2.65×10^{-4}	0.326
S-2, S-3, D-2, D-4	3.92×10^{-5}	0.142

* In monitoring wells S-1 and S-6, the cumulative carcinogenic risk is due to ingestion and inhalation of 1,1-DCE. The cumulative noncarcinogenic threat is due to ingestion of 1,1-DCE and 1,1,1-TCA, and inhalation of 1,1,1-TCA.

* In monitoring wells S-2, S-3, D-2, and D-4, the cumulative carcinogenic risk is due to ingestion and inhalation of dieldrin. The cumulative noncarcinogenic threat is due to ingestion of dieldrin.

TABLE 6: Combined Potential Carcinogenic Risk and Noncarcinogenic Threat Child Resident (6 years) & Adult Resident (24 years)

Monitoring Well Clusters	Combined Carcinogenic Risk	Combined Noncarcinogenic Threat (Hazard Index)
S-1, S-6	3.77×10^{-4}	1.10
S-2, S-3, D-2, D-4	6.28×10^{-5}	0.49

* The values presented in this table represent the combined carcinogenic risks and combined noncarcinogenic threats posed by exposure (via ingestion, inhalation, and dermal contact) to contaminated ground water over a 30 year period (6 years as a child + 24 years as an adult).

7.2 Ecological Risk Assessment

An Ecological Risk Assessment (ERA) was performed to determine if there is an actual or potential ecological risk as a result of exposure to Site-associated contaminants of concern. The ERA identified chromium as a contaminant of concern in the soil. However, few ecological receptors (e.g., animals, birds) were observed on, or in the vicinity of, the Site. In addition, there are no apparent ecological exposure pathways at the Site. Therefore, the ERA concluded that little or no ecological risk can be associated with the Site.

8. Description of the Selected Remedy

Under the Superfund Program, studies were conducted at the Site to characterize the nature and extent of contamination. These studies and other information which EPA used in choosing the selected remedy are contained in the Administrative Record for the Site (see Administrative Record Index in attached Appendix). The studies have indicated that exposure to ground water is the only potential concern. Because the ground water in the immediate vicinity of the Site is not used as a potable water source, there are no current risks associated with the Site. The risks calculated under a future use scenario are slightly above EPA's generally acceptable risk range. However, the State has instituted a Ground Water Management Zone (GMZ) which prohibits well installation on the entire Metal Masters' property. The GMZ will provide continued assurance that there is no direct contact with any contaminated ground water inside the property boundaries. In addition, an EPA-approved ground water monitoring program shall be implemented to ensure that contaminants do not migrate off-site at levels which would pose a threat to human

health and the environment in the future. Therefore, EPA has determined that no action is required at this time to protect human health and the environment.

EPA has determined that it is appropriate to monitor this situation and will conduct a periodic review of the conditions at the Site to verify that the No Action remedy remains protective of human health and the environment in accordance with Section 121(c) of CERCLA and 40 C.F.R. Section 300.430(f)(4)(ii) of the NCP.

9. Documentation of No Significant Change

The Proposed Plan for the Tyler Refrigeration Pit Site was released for public comment on February 21, 1996. The public comment period closed on March 22, 1996. EPA reviewed all written comments submitted during the public comment period. A summary of the comments received during the public comment period is included in the Responsiveness Summary section of this Record of Decision. Based on these comments, it was determined that no significant change to EPA's proposed remedy, as originally identified in the Proposed Plan, was necessary.

Responsiveness Summary

Tyler Refrigeration Pit Site Smyrna, Delaware

This Responsiveness Summary documents public comments received by the U.S. Environmental Protection Agency (EPA) during the public comment period on the Proposed Remedial Action Plan (Proposed Plan) for the Tyler Refrigeration Pit Site. It also provides EPA's responses to those comments.

A public comment period was held from February 21, 1996 through March 22, 1996 to receive comments from the public on the Proposed Remedial Action Plan and the remedial alternative for the Tyler Refrigeration Pit Site preferred by EPA. All comments received during the public comment period and corresponding responses are summarized below.

On behalf of Metal Masters Food Service Equipment Company, Inc. (Metal Masters), Groundwater Technology, Inc. submitted the following comments. Metal Masters concurs with the proposed no action remedial alternative but does not agree that the proposed ground water monitoring program is necessary to evaluate off-site levels of contamination based on the following reasons.

1. Groundwater quality data beginning in April 1988 to February 7, 1995 have shown decreasing concentrations.

Response: EPA agrees that the concentrations of Volatile Organic Compounds (VOCs) in wells S-2, S-3, S-4 and S-5 have decreased as depicted by three rounds of data (April 1988, September 1992, and February 1995). However, the concentrations of two of the main contaminants of concern (1,1-dichloroethene, 1,1,1-trichloroethane) have shown the opposite trend and have actually increased since April 1988 in wells S-1 and S-6. Furthermore, there is only one round of data for wells MM-1, MM-2, and MM-3. In the latest round of sampling (February 1995), the concentrations of 1,1-dichloroethene and 1,1,1-trichloroethane in MM-2 are still above their respective Maximum Contaminant Limits (MCLs).

2. Volatile organic compound concentrations in all three sampling events are extremely low and there is no active source area where groundwater quality is in question.

Response: EPA has established that the concentration of 1,1-dichloroethene, one of the contaminants that contributes to the carcinogenic risk at the Site, exceeded its MCL of 7 ppb in all three rounds. The concentrations of 1,1,1-trichloroethane which is also a contaminant of concern exceeded its MCL of 200 ppb in

the last two rounds of sampling. Regarding the issue of an active source area, the suspected source based on the DNREC Proposed Plan of Remedial Action was the TCA Storage Area (refer to Figure 7). DNREC concluded that the TCA Storage Area does not likely represent a continuing source because Metal Masters is no longer operating its plant at this location and little contamination remains in the soil. However, existing contamination in the ground water can still migrate whether or not an active source area exists.

3. Monitoring well S-1 which originally was the well that exhibited the highest concentrations was reported in the February 1995 sampling event to be non-detectable for trichloroethane and 1,1-dichloroethene.

Response: EPA agrees that the Metal Masters Food Service Equipment Co., Inc. Remedial Investigation Report (June 1995) reported non-detectable concentrations of all contaminants in well S-1. However, EPA is surprised that the concentrations in this well would have declined so dramatically in this time frame. Therefore, the collection of additional data from this well is particularly important within the monitoring program.

4. Natural attenuation will continue to reduce the already extremely low levels present in the groundwater at the site.

Response: While natural attenuation of the contaminants of concern through dilution or biodegradation may occur, many factors such as the rate at which this may or may not occur have not been determined. In addition, while organic chemicals degrade in the natural environment, studies have shown very little or no degradation for chemicals such as 1,1,1-trichloroethane or dieldrin in natural waters (Klecka, G.M. 1990. Biotransformations of 1,1,1-trichloroethane in ground water. *Environmental Toxicology & Chemistry*). One way to be certain that natural attenuation is actually occurring is through a monitoring program.

5. The State of Delaware is currently in the process of instituting a Groundwater Management Zone (GMZ) which will restrict well installation on the entire site property. This GMZ will provide continued assurance that no direct contact with the Site groundwater will occur.

Response: EPA acknowledges that on February 20, 1996, the State of Delaware instituted a GMZ which should prevent contact with any contaminated groundwater within the Metal Master's property boundaries. However, EPA believes that it is important to monitor the levels of contamination that may be migrating beyond the property boundaries and beyond the boundaries of the GMZ to ensure that there is no threat to human health or the environment

downgradient of the GMZ. Additionally, it should be noted that the wells with the highest concentrations of contaminants in the latest sampling round (wells MM-2 and S-6) lie at the Site boundary and beyond the site boundary, respectively, in the direction of groundwater flow.

6. There is a town ordinance that prohibits the future installation of private drinking wells. This will assure that no future ground water wells immediately downgradient of the Site are installed for groundwater ingestion.

Response: According to EPA's conversations with the Smyrna Water Supply Operator, there is no town ordinance which prohibits the future installation of private drinking water wells on or downgradient of the Site. Additionally, with the exception of a small portion of the Site which lies in the northeast corner of the property, the Site actually lies outside the town boundaries. However, the State GMZ will prohibit well installation on-site.

FIGURES

AR303524

Figure 1

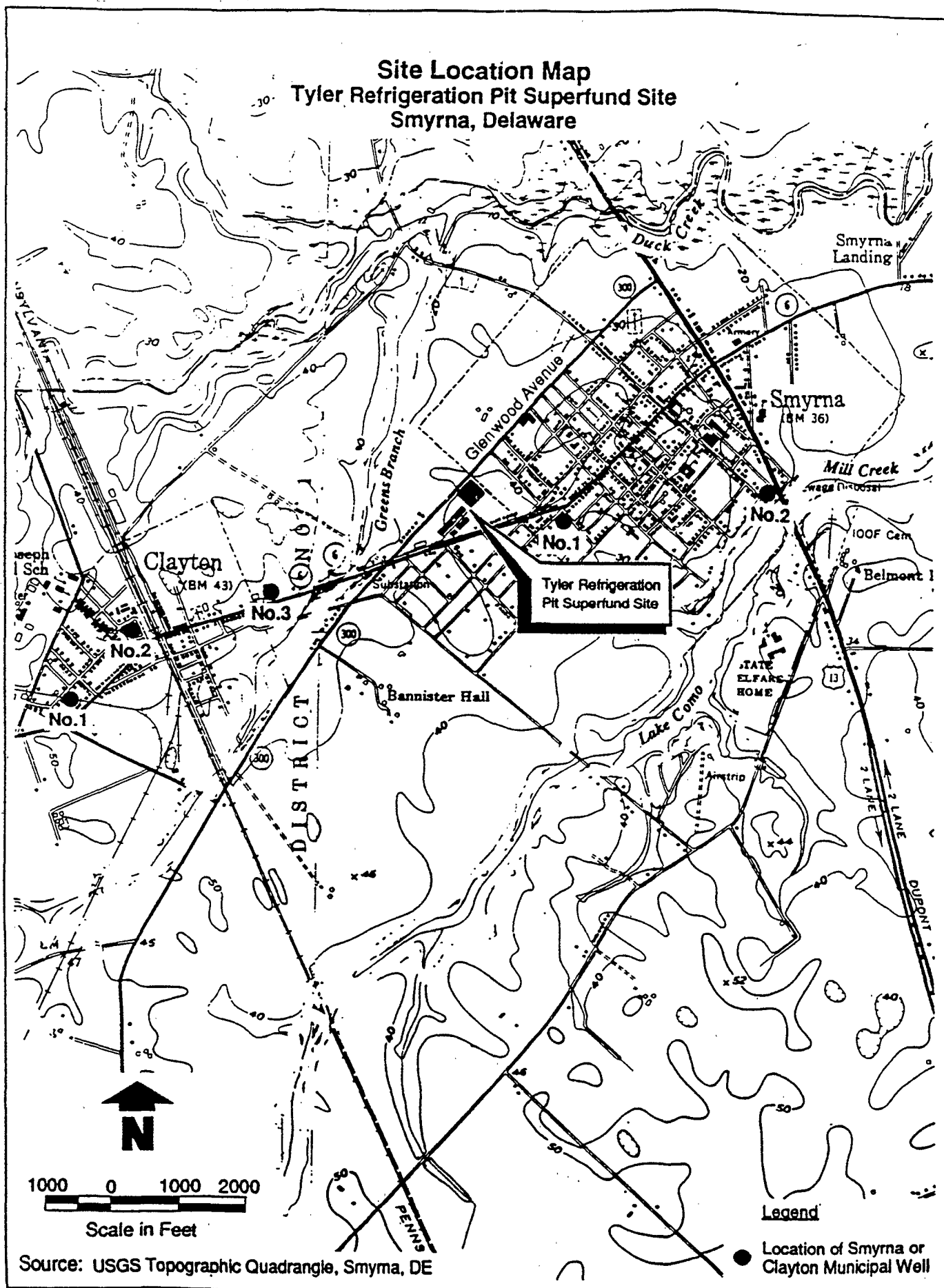
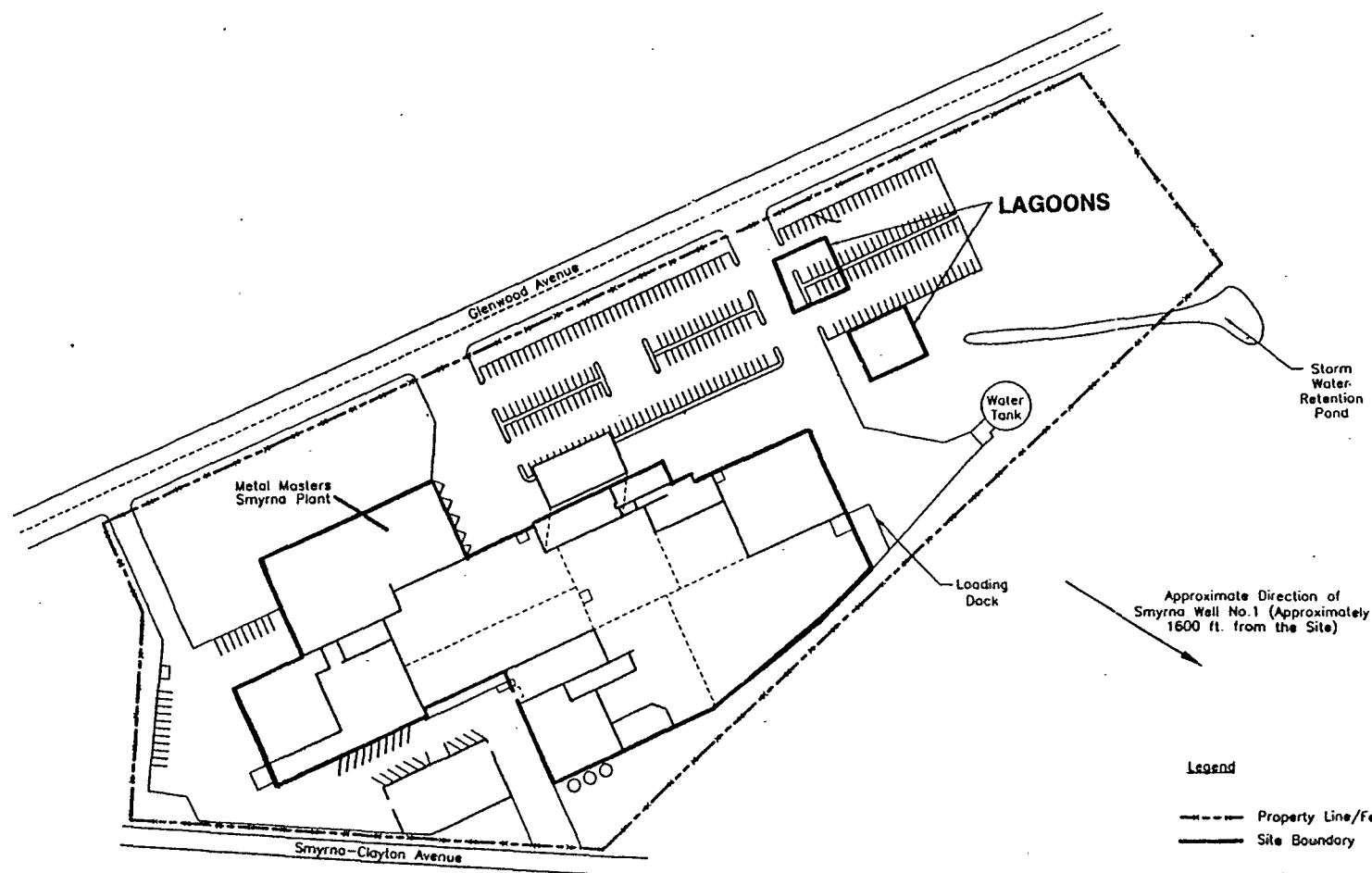


Figure 2
RI Site Map
Tyler Refrigeration Pit
Superfund Site
Smyrna, Delaware



125 0 125
 Scale Feet



P-02

22

AR303527

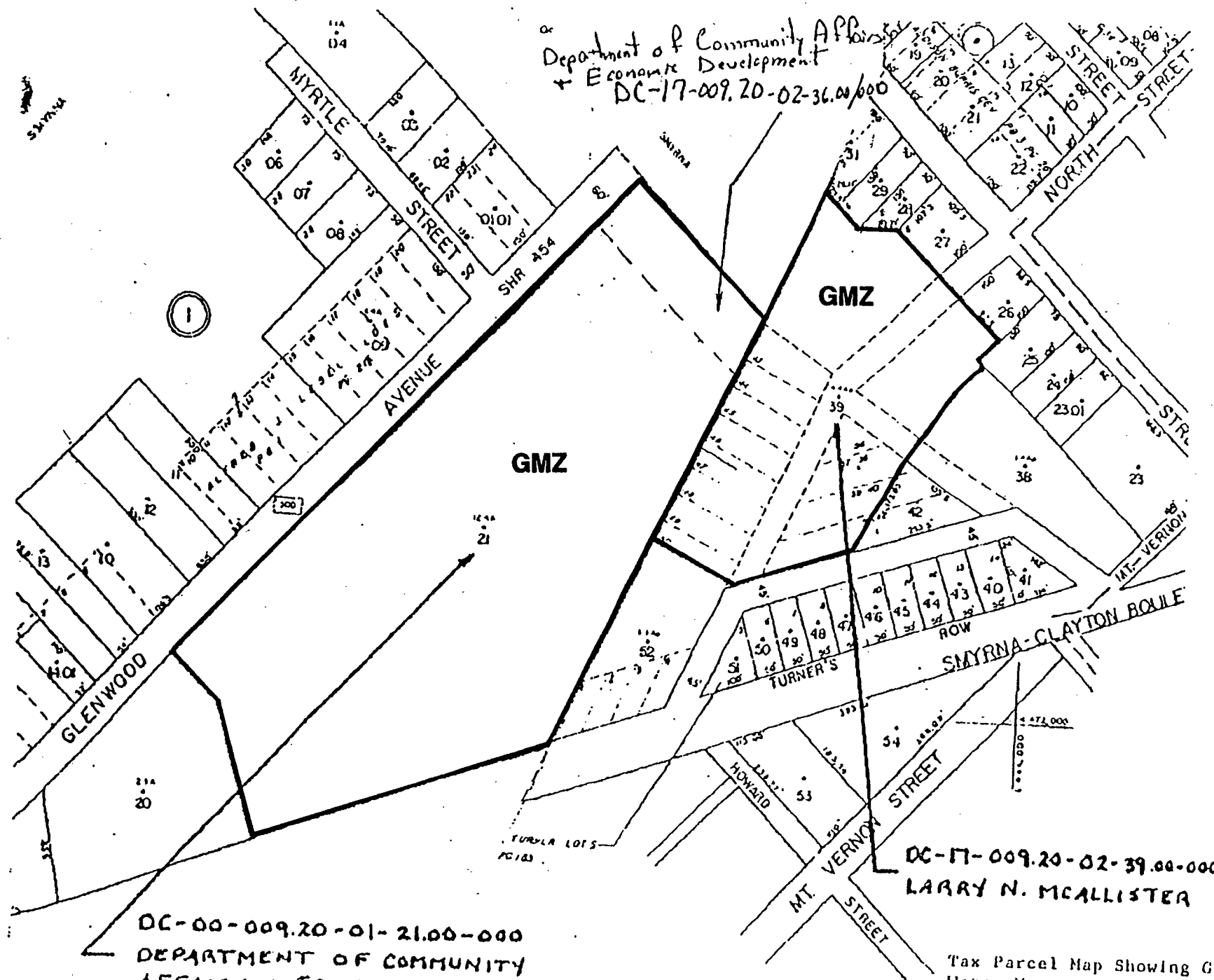


Figure 3

Tax Parcel Map Showing Ground Water Management Zone Boundaries

Figure 4
Surface Soil Sample Location Map
Tyler Refrigeration Plt
Superfund Site
Smyna, Delaware

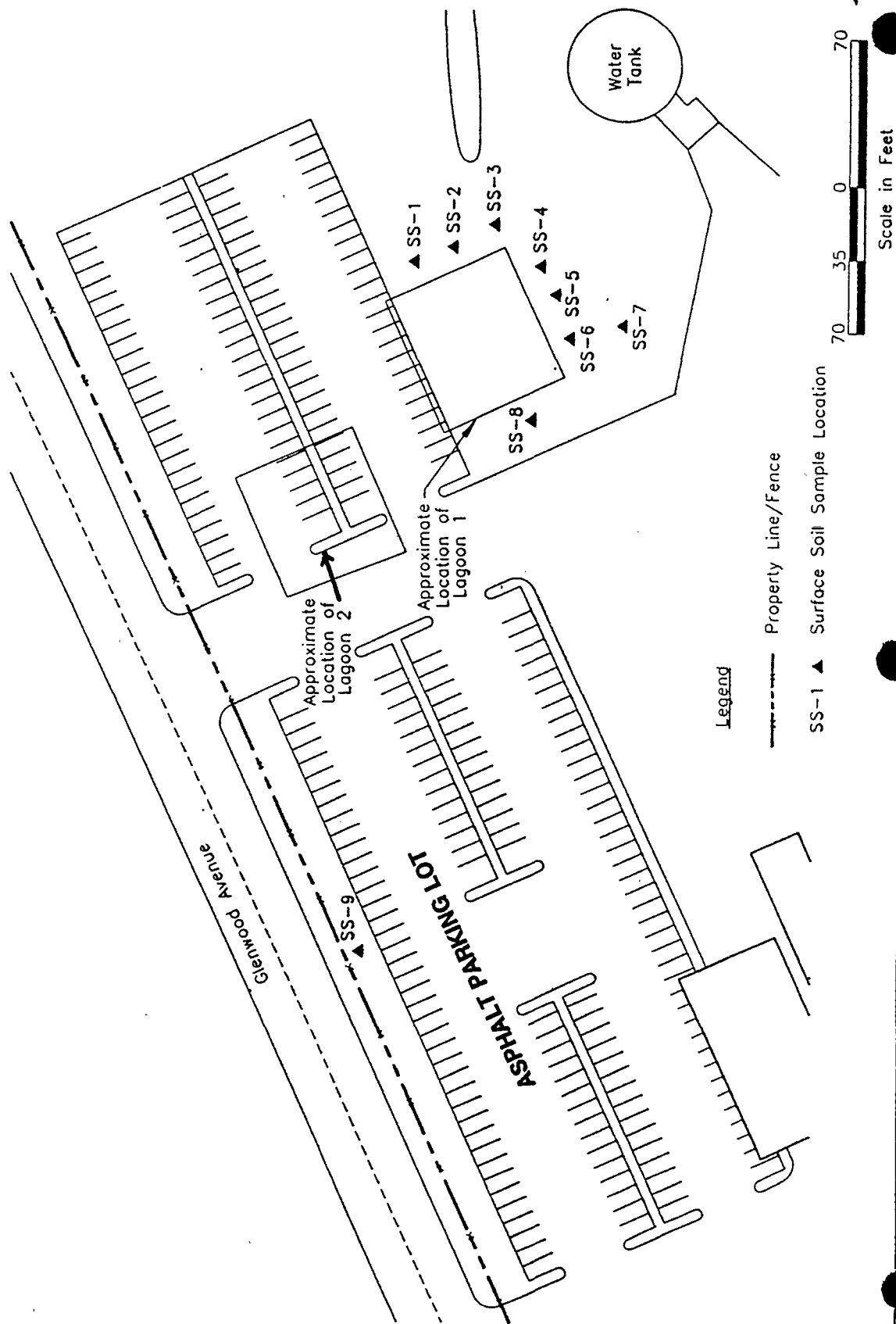


Figure 5
Soil Boring Location Map
Tyler Refrigeration Pit
Superfund Site
Smyrna, Delaware

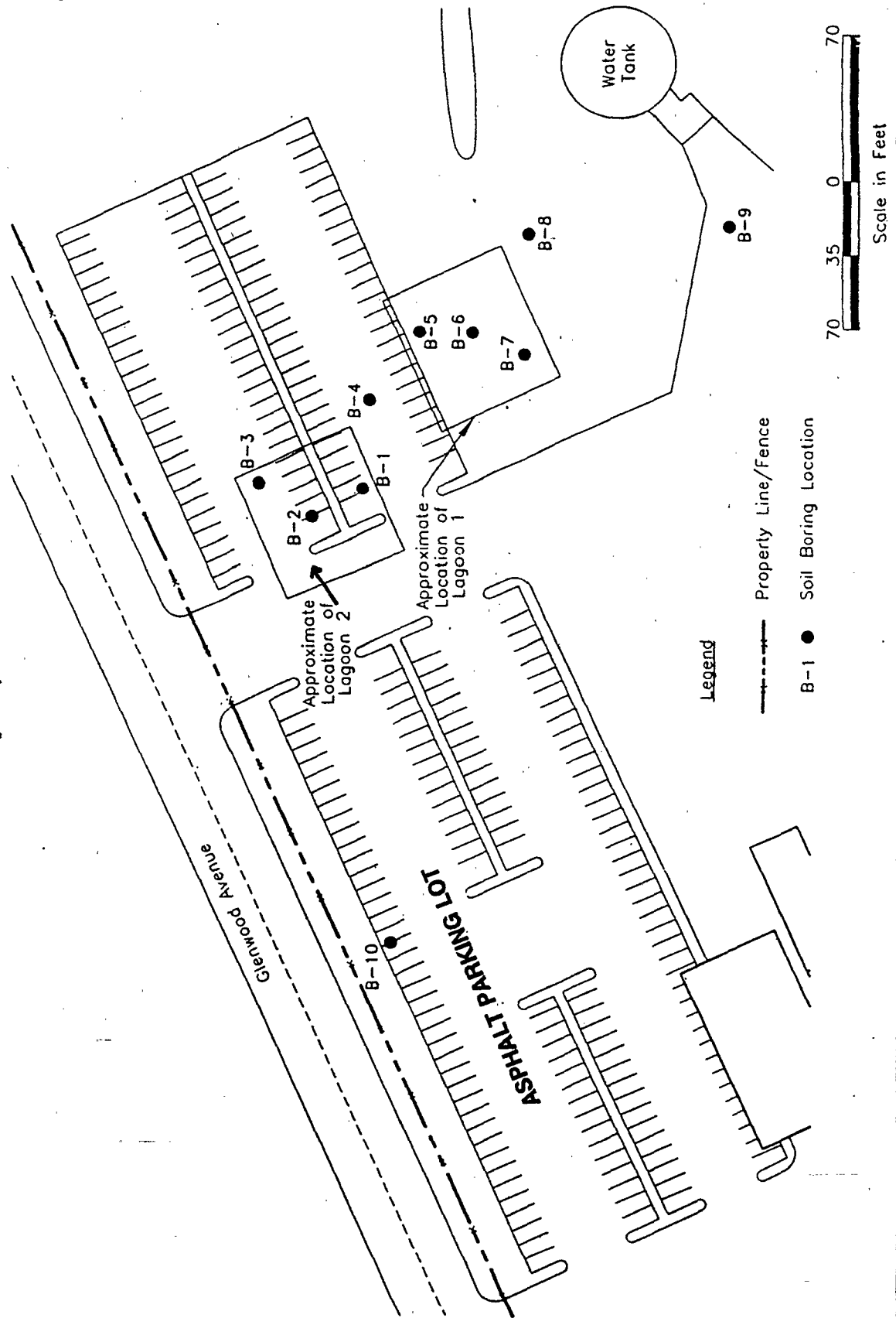
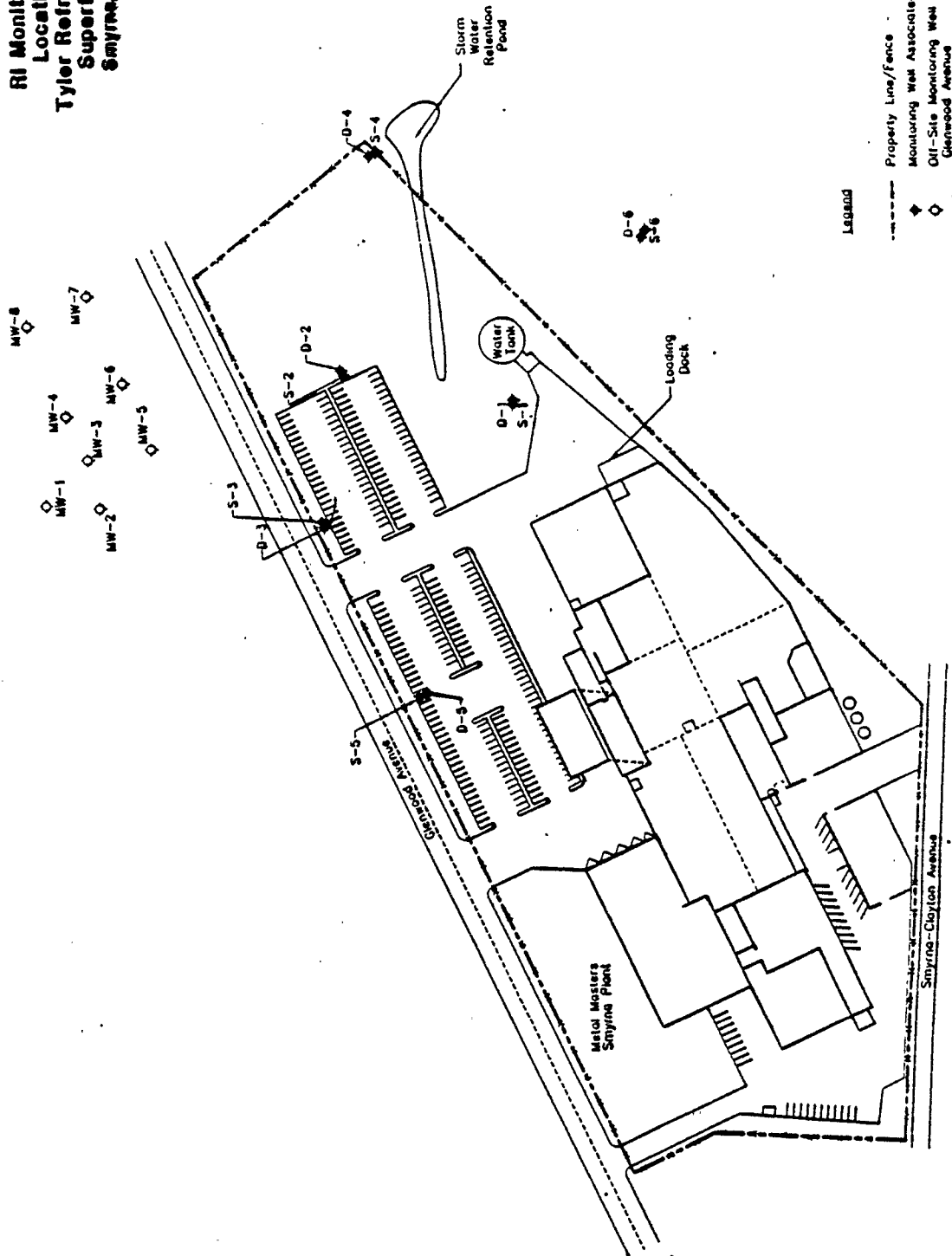


Figure 6

RI Monitoring Well
Location Map
Tyler Refrigeration Pit
Superfund Site
Smyrna, Delaware



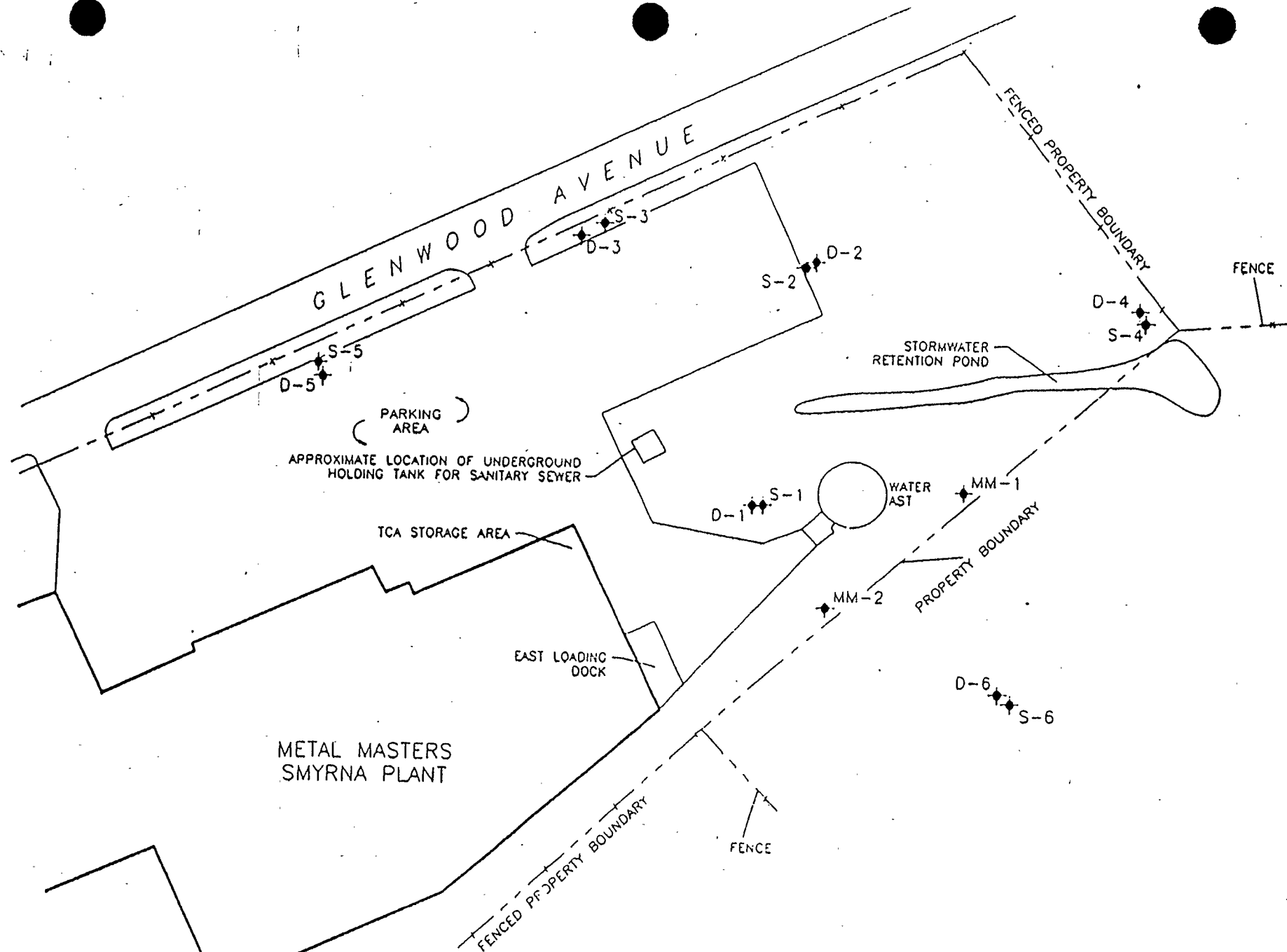


Figure 7
LOCATION OF SOURCE AREAS
DNREC REMEDIAL INVESTIGATION

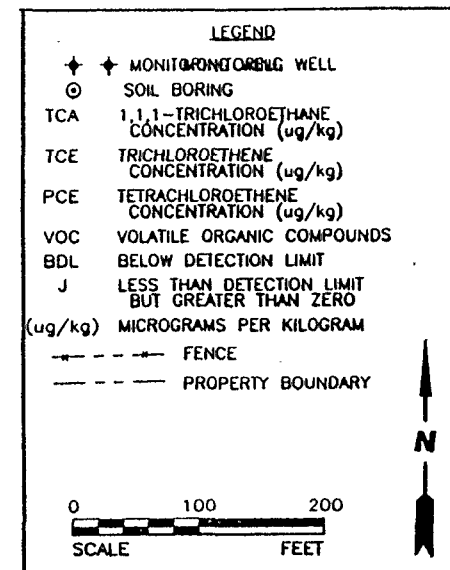


Figure 8

SOIL RESULTS

DNREC REMEDIAL INVESTIGATION

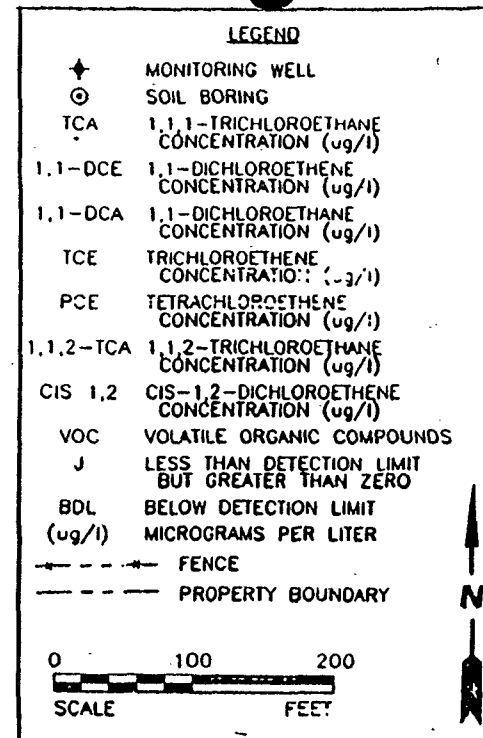
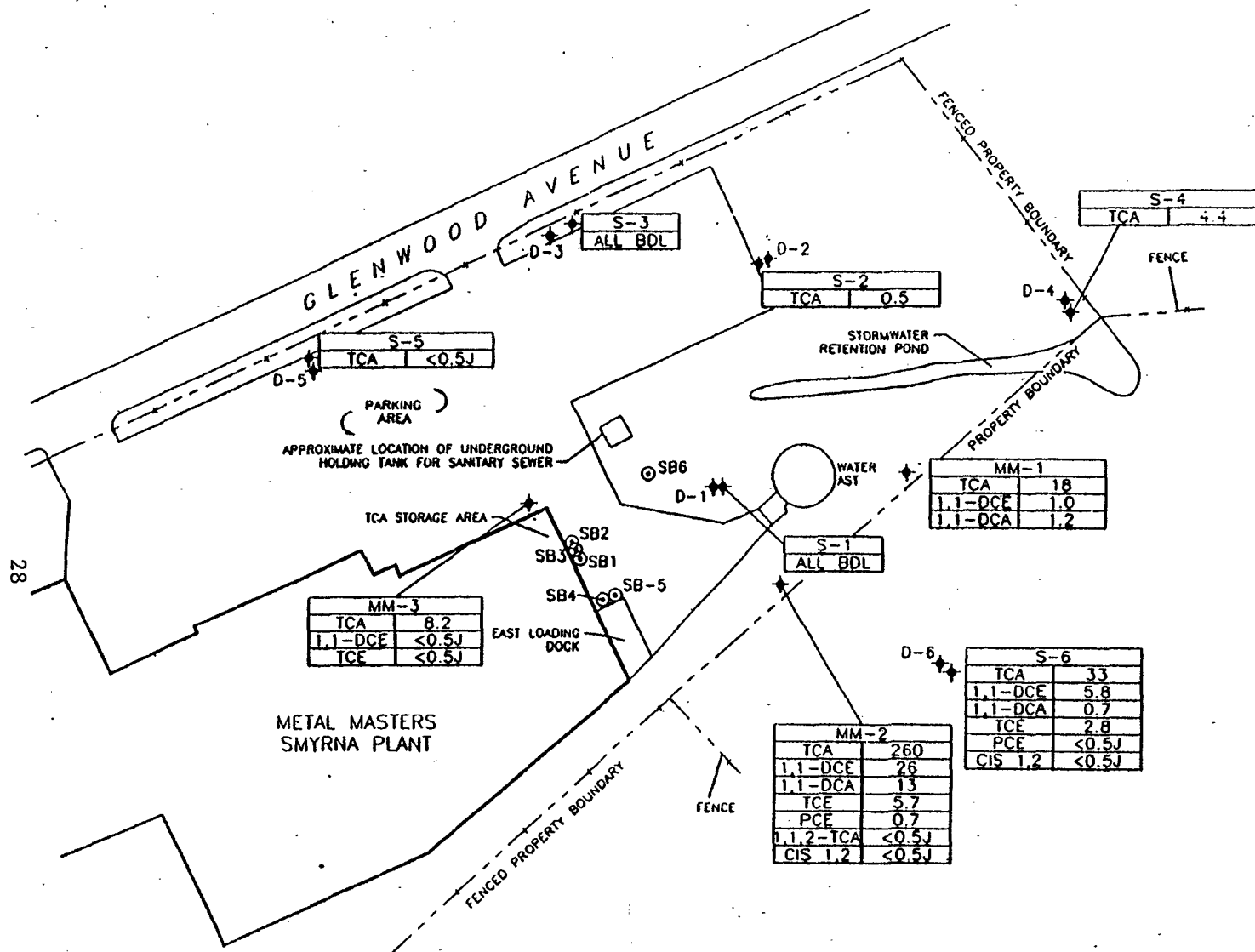


Figure 9
GROUND WATER RESULTS
DNREC REMEDIAL INVESTIGATION

AR303533

Appendix

AR303534



STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
DIVISION OF AIR AND WASTE MANAGEMENT
715 GRANTHAM LANE
NEW CASTLE, DELAWARE 19720-4801

WASTE MANAGEMENT SECTION
SUPERFUND BRANCH

TELEPHONE: (302) 323-4540
FAX: (302) 323-4561

April 11, 1996

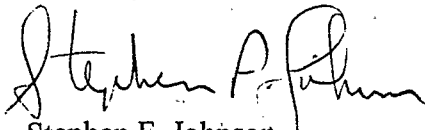
Ms. Lisa Marino (3HW42)
US EPA Region III
841 Chestnut Building
Philadelphia, PA 19107

RE: Tyler Refrigeration Site Record of Decision

Dear Ms. Marino:

The Department of Natural Resources and Environmental Control is pleased to offer concurrence with the above referenced Record of Decision of behalf of the State of Delaware.

Sincerely,


Stephen F. Johnson
Environmental Engineer

SFJ:dmg
SFJ96030

cc: Jamie H. Rutherford
File: DE-043.II.I.5

Delaware's good nature depends on you!

AR303535

TYLER REFRIGERATION PIT
ADMINISTRATIVE RECORD FILE *
INDEX OF DOCUMENTS

I. SITE IDENTIFICATION

1. Memorandum to Mr. Mike Apgar from Mr. Ron Stoufer, re: Chemical data on ground water samples collected from wells in Smyrna, 4/18/78. P. 100001-100013. The following are attached:
 - a) Table 1, Concentrations in Water Collected from Wells in Smyrna on March 14, 1978;
 - b) Table 2, Data on Smyrna Well #2 when the Well was Constructed in 1958;
 - c) a memorandum regarding a summary report on the trichloroethylene contamination investigation in Smyrna, dated May 31, 1978;
 - d) three site location maps;
 - e) a memorandum regarding information about Tyler Refrigeration Waste Pit in relation to the trichloroethylene problem in Smyrna's wells, dated May 1, 1979.
2. U.S. EPA Potential Hazardous Waste Site Identification and Preliminary Assessment, Tyler Refrigeration, 10/25/82. P. 100014-100042. Two Site Inspection reports, a letter regarding information about domestic wells in the vicinity of the site dated June 28, 1985, and a site location map are attached.
3. Report: Preliminary Assessment and Site Inspection of Tyler Refrigeration, prepared by Ecology and Environment, Inc., 10/28/82. P. 100043-100146.
4. Report: A Preliminary Assessment of Tyler Refrigeration, prepared by Delaware Department of Natural Resources and Environmental Control (DNREC), 12/83. P. 100147-100180.
5. Report: Non-Sampling Site Inspection Using Available Information of Tyler Refrigeration, prepared by NUS Corporation, 6/10/85. P. 100181-100428.

* Administrative Record File available 8/26/92, updated 9/9/93, 11/11/93, 12/6/93, 12/1/95, 2/12/96, and 3/15/96.

AR303536

TYLER REFRIGERATION PIT
ADMINISTRATIVE RECORD FILE *
INDEX OF DOCUMENTS

I. SITE IDENTIFICATION

1. Memorandum to Mr. Mike Apgar from Mr. Ron Stoufer, re: Chemical data on ground water samples collected from wells in Smyrna, 4/18/78. P. 100001-100013. The following are attached:
 - a) Table 1, Concentrations in Water Collected from Wells in Smyrna on March 14, 1978;
 - b) Table 2, Data on Smyrna Well #2 when the Well was Constructed in 1958;
 - c) a memorandum regarding a summary report on the trichloroethylene contamination investigation in Smyrna, dated May 31, 1978;
 - d) three site location maps;
 - e) a memorandum regarding information about Tyler Refrigeration Waste Pit in relation to the trichloroethylene problem in Smyrna's wells, dated May 1, 1979.
2. U.S. EPA Potential Hazardous Waste Site Identification and Preliminary Assessment, Tyler Refrigeration, 10/25/82. P. 100014-100042. Two Site Inspection reports, a letter regarding information about domestic wells in the vicinity of the site dated June 28, 1985, and a site location map are attached.
3. Report: Preliminary Assessment and Site Inspection of Tyler Refrigeration, prepared by Ecology and Environment, Inc., 10/28/82. P. 100043-100146.
4. Report: A Preliminary Assessment of Tyler Refrigeration, prepared by Delaware Department of Natural Resources and Environmental Control (DNREC), 12/83. P. 100147-100180.
5. Report: Non-Sampling Site Inspection Using Available Information of Tyler Refrigeration, prepared by NUS Corporation, 6/10/85. P. 100181-100428.

* Administrative Record File available 8/26/92; updated 9/9/93, 11/11/93, 12/6/93, 12/1/95, 2/12/96, and 3/15/96.

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6. Report: A Field Trip Report for Tyler Refrigeration, prepared by NUS Corporation, 8/15/86. P. 100429-100473. Two cover letters and a memorandum dated July 21, 1986 requesting assistance from the Field Investigation Team (FIT) office are attached.
7. Letter to Ms. Stephanie L. Papa, U.S. EPA, from Mr. David J. Carlson, Dames & Moore, re: Transmittal of sampling and groundwater investigation documents, 9/25/89. P. 100474-100570. The following are attached:
- a) a letter regarding analytical laboratory results, dated December 28, 1988;
 - b) Table 1, Summary of Analytical Laboratory Data, Tyler Refrigeration, Smyrna, Delaware;
 - c) Table 2, Summary of Analytical Laboratory Data, Tyler Refrigeration, Smyrna, Delaware;
 - d) a Plot Plan Showing Monitoring Well Locations and Ground Water Flow Direction;
 - e) a letter regarding the assessment of the direction of groundwater flow, dated May 2, 1989;
 - f) a Clark Equipment Company table containing information on water levels;
 - g) a Ground Water Flow map;
 - h) Appendix A, Stevens Recorder Charts;
 - i) an Analytical Report prepared by National Environmental Testing, Inc.
8. Report: A Follow-Up Site Inspection of Tyler Refrigeration, prepared by DNREC, (undated). P. 100571-100970.

II. REMEDIAL ENFORCEMENT PLANNING

1. Administrative Order On Consent For Remedial Investigation/Feasibility Study In The Matter Of: Tyler Refrigeration Pit, Clark Equipment Company, Respondent, Docket No. III-91-33-DC, 3/28/91. P. 200001-200036. Exhibit A, Summary Statement of Work, and Exhibit B, List of Documents, are attached.

III. REMEDIAL RESPONSE PLANNING

1. Report: Preliminary Health Assessment for Tyler Refrigeration Pit, Smyrna, Delaware, prepared by the Agency for Toxic Substances and Disease Registry (ATSDR), 11/15/88. P. 300001-300004.
2. Report: Draft Remedial Investigation/Feasibility Study (RI/FS) Work Plan, Tyler Refrigeration Pit Superfund Site, Smyrna, Delaware, prepared by Environmental Resources Management, Inc., 7/15/91. P. 300005-300319. A cover letter is attached.
3. Letter to Mr. David P. Steele, Environmental Resources Management, Inc., from Ms. Stephanie Dehnhard, U.S. EPA, re: Comments on the draft RI/FS Work Plan, 10/1/91. P. 300320-300347. Specific Comments on the RI/FS, a Quality Assurance Project Plan Review checklist, and Appendix A to the checklist are attached.
4. Memorandum to file from Ms. Stephanie Dehnhard, U.S. EPA, re: Conference call to discuss EPA's comments on the RI/FS Work Plan, 10/24/91. P. 300348-300350.
5. Letter to Ms. Stephanie Dehnhard, U.S. EPA, from Mr. David P. Steele, Environmental Resources Management, Inc., re: Summary of a conference call concerning the draft RI/FS Work Plan, 10/29/91. P. 300351-300354.
6. Report: RI/FS Work Plan, Tyler Refrigeration Pit Superfund Site, Smyrna, Delaware, prepared by Environmental Resources Management, Inc., 11/12/91. P. 300355-300700. A cover letter is attached.
7. Letter to Ms. Stephanie Dehnhard, U.S. EPA, from Mr. David P. Steele, Environmental Resources Management, Inc., re: Information to aid in reviewing the revised draft RI/FS Work Plan, 12/5/91. P. 300701-300793. A table summarizing contents of the Work Plan and its components and the response to EPA's comments on the RI/FS Quality Assurance Project Plan are attached.
8. Memorandum to Ms. Stephanie Dehnhard, U.S. EPA, from Mr. Jeffrey A. Dodd, U.S. EPA, re: Review comments on the revised Quality Assurance Project Plan, 12/17/91. P. 300794-300817. The Field Filtration Policy for Monitoring Well Groundwater Samples Requiring Metals Analysis, a Quality Assurance Project Plan Review checklist, and Appendix A to the checklist are attached.

9. Letter to Mr. David P. Steele, Environmental Resources Management, Inc., from Ms. Stephanie Dehnhard, U.S. EPA, re: Comments on the revised RI/FS Work Plan, 2/11/92. P. 300818-300824. The comments are attached.
10. Memorandum to file from Ms. Stephanie Dehnhard, U.S. EPA, re: Conference call to discuss EPA comments on the revised RI/FS Work Plan, 3/4/92. P. 300825-300827.
11. Letter to Mr. David P. Steele, Environmental Resources Management, Inc., from Ms. Stephanie Dehnhard, U.S. EPA, re: Off-site shipment of hazardous substances, 3/10/92. P. 300828-300829.
12. Letter to Ms. Shawne Rodgers, Environmental Resources Management, Inc., from Mr. Jeffrey A. Dodd, U.S. EPA, re: Example copies of EPA's Special Analytical Service (SAS) Requests for analytical methods, technical, and quality control requirements, 3/13/92. P. 300830-300847. Three SAS Requests and an article entitled "Procedures in Sedimentary Petrology" are attached.
13. Report: RI/FS Work Plan, Tyler Refrigeration Pit Superfund Site, Smyrna, Delaware, prepared by Environmental Resources Management, Inc., 3/16/92. P. 300848-301296.
14. Letter to Ms. Stephanie Dehnhard, U.S. EPA, from Mr. David P. Steele, Environmental Resources Management, Inc., re: Amended version of the RI/FS Work Plan, 3/16/92. P. 301297-301385. The amended version of the Work Plan and information concerning the Flooding Basin Used for Measuring Infiltration are attached.
15. Letter to Mr. Jeffrey A. Dodd, U.S. EPA, from Ms. Shawne M. Rodgers, Environmental Resources Management, Inc., re: Environmental Resources Management, Inc.'s response to EPA's comments on the Quality Assurance Project Plan for the RI/FS, 3/25/92. P. 301386-301416. The following are attached:
 - a) Response to EPA Comments Regarding the Quality Assurance Project Plan for the Remedial Investigation/Feasibility Study at the Tyler Refrigeration Pit Superfund Site (Revision 1);
 - b) Table 4-1, Containers, Preservatives, and Holding Times;
 - c) Figure 13-1, Corrective Action Form;

- d) Table 12-2, Validation of Vinyl Chloride Data by Method 8010;
 - e) ERM's Laboratory Data Quality Assurance information;
 - f) a Job Summary Sheet for Laboratory ID numbers 34-001 to -004;
 - g) Tuning Procedures for Gas Chromatography/Mass Spectrometry (GC/MS) Analyses - 3/90 SOW;
 - h) Table 5-4, Criteria for Instrument Performance Check;
 - i) Laboratory Method Blanks information;
 - j) Sample Analyses information;
 - k) Scoring Qualifier Explanation information;
 - l) two Organic Preaward Evaluation Sample Individual Laboratory Summary Reports;
 - m) two Preaward Performance Evaluation Sample Score Sheets.
16. Memorandum to Ms. Stephanie Dehnhard, U.S. EPA, from Mr. Jeffrey A. Dodd, U.S. EPA, re: Review comments on the second revision of the Quality Assurance Project Plan, 3/31/92. P. 301417-301436. A Quality Assurance Project Plan Review checklist and Appendix A, Data Reduction, Validation, and Reporting, are attached.
 17. Letter to Ms. Stephanie Dehnhard, U.S. EPA, from Mr. John Gysling, DNREC, re: Review of the RI/FS Work Plan revision, 5/7/92. P. 301437-301437.
 18. Letter to Mr. David P. Steele, Environmental Resources Management, Inc., from Ms. Stephanie Dehnhard, U.S. EPA, re: Review of the March 16, 1992 RI/FS work plan, 6/9/92. P. 301438-301450. A memorandum dated March 31, 1992 regarding review comments on the second revision of the Quality Assurance Project Plan, a Quality Assurance Project Plan Review checklist, and Appendix A, Data Reduction, Validation, and Reporting, are attached.

19. Letter to Ms. Stephanie Dehnhard, U.S. EPA, from Mr. David P. Steele, Environmental Resources Management, Inc., re: Amended sections to the Work Plan for the RI/FS, 6/26/92. P. 301451-301537. The amended sections are attached.
20. Letter to Mr. Jeffrey A. Dodd, U.S. EPA, from Ms. Shawne M. Rodgers, Environmental Resources Management, Inc., re: Response to EPA comments concerning the second revision to the RI/FS Quality Assurance Project Plan, 6/26/92. P. 301538-301543. The response is attached.
21. Memorandum to Ms. Stephanie Dehnhard, U.S. EPA, from Mr. Jeffrey A. Dodd, U.S. EPA, re: Review comments on the second revision of the Quality Assurance Project Plan, 7/8/92. P. 301544-301546.
22. Letter to Ms. Stephanie Dehnhard, U.S. EPA, from Mr. David P. Steele, Environmental Resources Management, Inc., re: Monthly progress report on activities in June 1992 for the RI/FS, 7/15/92. P. 301547-301548.
23. Letter to Mr. David P. Steele, Environmental Resources Management, Inc., from Ms. Stephanie Dehnhard, U.S. EPA, re: Review of the revised sections of the RI/FS Work Plan and the Field Sampling Plan, 7/21/92. P. 301549-301552. A memorandum dated July 8, 1992 regarding Mr. Jeff Dodd's comments on the revised Quality Assurance Project Plan and the Geotechnical Analysis Comprehensive Quality Assurance Plan is attached.
24. Letter to Ms. Stephanie Dehnhard, U.S. EPA, from Ms. Shawne M. Rodgers, Environmental Resources Management, Inc., re: Revised sections of the Quality Assurance Project Plan, 8/5/92. P. 301553-301553.
25. Letter to Mr. David P. Steele, Environmental Resources Management, Inc., from Ms. Stephanie Dehnhard, U.S. EPA, re: Review of the response to comments on the Quality Assurance Project Plan, 8/13/92. P. 301554-301554.
26. Facsimile transmittal sheet to Ms. Stephanie Dehnhard, U.S. EPA, from Mr. Jeff Dodd, U.S. EPA, re: Review of information sent by Environmental Resources Management, Inc. in response to EPA's comments on July 8, 1992, (undated). P. 301555-301558. A memorandum dated July 8, 1992 regarding review comments on the Quality Assurance Project Plan is attached.

27. Report: Trip Report for RI/FS Oversight at the Tyler Refrigeration Pit Site, Smyrna, Delaware, prepared by Dynamac Corporation, 9/30/92. P. 301559-301717.
28. Letter to Mr. David L. Jones, Clark Equipment Company, from Ms. Lisa Marino, U.S. EPA, re: Request for submittal of an amendment to the RI/FS Work Plan describing the additional investigative tasks necessary for the assessment, 12/23/92. P. 301718-301719.
29. Report: Tyler Refrigeration Pit Superfund Site Remedial Investigation, Clark Equipment Company, prepared by Environmental Resources Management, Inc., 1/19/93. P. 301720-302004.
30. Report: Comments on the Remedial Investigation Report, Tyler Refrigeration Pit Site, Smyrna, Delaware, prepared by Dynamac Corporation, 2/10/93. P. 302005-302018.
31. Letter to Ms. Lisa Marino, U.S. EPA, from Mr. David L. Jones, Clark Equipment Company, re: Data, information, and circumstances relating to the detection of TCA in monitoring well S-1, 2/11/93. P. 302019-302022.
32. Letter to Ms. Lisa Marino, U.S. EPA, from Ms. M. Margie Zhang, DNREC, re: Comments and suggestions on the draft Remedial Investigation Report, 2/22/93. P. 302023-302026. Figure 1, Calculation of zone of pumping influence, and a graph of quality v. time for Smyrna Well #1 are attached.
33. Letter to Ms. Lisa Marino, U.S. EPA, from Ms. M. Margie Zhang, DNREC, re: Comments and suggestions on the review of Mr. David Jones' letter dated February 11, 1993, 3/1/93. P. 302027-302031. Figure 1, Distribution pattern of TCA concentration, and a graph of quality v. time for Smyrna Well #1 are attached.
34. Letter to Mr. David L. Jones, Clark Equipment Company, from Ms. Lisa Marino, U.S. EPA, re: Comments on the draft Remedial Investigation Report, 3/4/93. P. 302032-302049. The comments are attached.
35. Letter to Ms. Margie Zhang, DNREC, from Ms. Lisa Marino, U.S. EPA, re: Review of proposal outlined in the letter dated March 1, 1993 and request for clarification on some points made by DNREC, 3/18/93. P. 302050-302051.

36. Letter to Ms. Lisa Marino, U.S. EPA, from Ms. M. Margie Zhang, DNREC, re: Answers to questions asked in the letter dated March 18, 1993, 4/1/93. P. 302052-302058. Figure 1, Distribution pattern of TCA concentration; Figure 19.10, Capture-zone type curves for one, two, three and four wells; and handwritten notes on the calculation of the pumping rate for a recovery well are attached.
37. Letter to Ms. Lisa Marino, U.S. EPA, from Mr. David P. Steele, Environmental Resources Management, Inc., re: Summary of responses to comments by EPA on the draft Remedial Investigation Report, 4/6/93. P. 302059-302078. The summary of responses to comments is attached.
38. Letter to Ms. Lisa Marino, U.S. EPA, from Sathya Yalvigi and Mr. Camille Costa, Dynamac Corporation, re: Review and comments of the PRP's response to EPA comments on the draft Remedial Investigation Report, 4/15/93. P. 302079-302080.
39. Memorandum to file from Ms. Lisa Marino, U.S. EPA, re: Summary of a meeting discussing the hydrogeological issues of the site, 4/19/93. P. 302081-302081.
40. Letter to Mr. David L. Jones, Clark Equipment Company, from Ms. Lisa M. Marino, U.S. EPA, re: Ecological issues which should be addressed in the final Remedial Investigation Report, 4/19/93. P. 302082-302082.
41. Memorandum to Ms. Lisa Marino, U.S. EPA, from Ms. Dawn A. Ioven, U.S. EPA, re: Information on the Baseline Risk Assessment, 4/20/93. P. 302083-302114. Fourteen tables and three toxicity profiles relating to the Baseline Risk Assessment are attached.
42. Memorandum to file from Ms. Lisa Marino, U.S. EPA, re: Dynamac's remaining issue with the Remedial Investigation Report concerning the source of TCA/DCE contamination, 4/22/93. P. 302115-302115.
43. Letter to Ms. Margie Zhang, DNREC, from Ms. Lisa M. Marino, U.S. EPA, re: Determination that there is not enough evidence to require additional investigation of the former lagoons and concurrence with the submitted proposal for remediation of the plume of the TCA/DCE contamination, 4/23/93. P. 302116-302116.
44. Memorandum to Ms. M. Margie Zhang, DNREC, from Ms. Lisa M. Marino, U.S. EPA, re: Comments on the Baseline Risk Assessment, 5/20/93. P. 302117-302122.

45. Letter to Ms. Lisa M. Marino, U.S. EPA, from Mr. David P. Steele and Ms. Robin Streeter, Environmental Resources Management, Inc., re: Comments on the draft Baseline Risk Assessment, 5/21/93. P. 302123-302128.
46. Letter to Mr. David L. Jones, Clark Equipment Company, from Ms. Lisa M. Marino, U.S. EPA, re: Notice to Mr. Clark that the Feasibility Study does not need to be presented or developed, 5/26/93. P. 302129-302129.
47. Letter to Ms. Lisa Marino, U.S. EPA, from Mr. David P. Steele, Environmental Resources Management, Inc., re: Final edits to the Remedial Investigation Report, 5/27/93. P. 302130-302145. The edits are attached.
48. Letter to Mr. David L. Jones, Clark Equipment Company, from Ms. Lisa M. Marino, U.S. EPA, re: EPA's incorporation of comments on the Baseline Risk Assessment as an addendum and inquiry on the comment of the Location of Ground Water Sampling Locations, 6/2/93. P. 302146-302146.
49. Memorandum to Ms. Lisa Marino, U.S. EPA, from Ms. Dawn Ioven, U.S. EPA, re: Summary of DNREC's comments and EPA's response to the comments, 6/3/93. P. 302147-302148.
50. Letter to Mr. Robert Davis, U.S. EPA, from Mr. Robert Foley, U.S. Fish and Wildlife Service, re: Technical comments on the Ecological Risk Assessment, 6/1/93. P. 302149-302151.
51. Letter to Ms. Lisa Marino, U.S. EPA, from David P. Steele, Environmental Resources Management, Inc., re: Preliminary comments on the Ecological Risk Assessment, 6/2/93. P. 302152-302155.
52. Memorandum to Ms. Margie Zhang, DNREC, from Mr. Rob Allen, U.S. EPA, re: Review of the Ecological Risk Assessment, 6/4/93. P. 302156-302156.
53. Memorandum to Mr. Bob Davis, U.S. EPA, from Ms. Lisa Marino, U.S. EPA, re: Comments on the Environmental Risk Assessment, 7/21/93. P. 302157-302158. A memorandum regarding a review of Environmental Resources Management's responses on the Remedial Investigation is attached.

54. Letter to Ms. Lisa Marino, U.S. EPA, from Mr. David L. Jones, Clark Equipment Company, re: Summary of Environmental Resources Management's comments on the Ecological Risk Assessment, 10/7/93. P. 302159-302167. A letter regarding Environmental Resources Management's comments on the Ecological Risk Assessment is attached.
55. Report: Tyler Refrigeration Ecological Risk Assessment, prepared by U.S. EPA, 10/27/93. P. 302168-302178.
56. Letter to Mr. David L. Jones, Clark Equipment Company, from Ms. Lisa M. Marino, U.S. EPA, re: Responses to Environmental Resources Management's comments on the Ecological Risk Assessment, 10/28/93. P. 302179-302180.
57. Letter to Ms. Lisa Marino, U.S. EPA, from Mr. David P. Steele, Environmental Resources Management, re: Comments on review of the final Ecological Risk Assessment, 11/29/93. P. 302181-302182.
58. Report: Remedial Investigation Report, Metal Masters Food Services Co., Inc., Smyrna, Delaware, Volume I, prepared by Groundwater Technology Inc., 6/2/95. P. 302183-302459. A transmittal letter dated August 14, 1995, is attached.
59. Report: Remedial Investigation Report, Metal Masters Food Services Co., Inc., Smyrna, Delaware, Volume II, prepared by Groundwater Technology Inc., 6/2/95. P. 302460-303465.
60. Final Plan of Remedial Action, Metal Masters Site, Smyrna, Delaware, prepared by Department of Natural Resources & Environmental Control, 10/95. P. 303466-303480. A facsimile cover sheet dated October 25, 1995, is attached.
61. Proposed Plan, Tyler Refrigeration Pit Superfund Site, 2/96. P. 303481-303490.
62. Letter to Ms. Lisa Marino, U.S. EPA, from Mr. Stephen F. Johnson, DNREC, re: DNREC's concurrence with the proposed plan except for EPA's decision to require future groundwater monitoring at the site, 2/7/96. P. 303491-303491.

63. Memorandum of agreement between DNREC's Division of Air and Waste Management and Division of Water Resources for the Tyler Refrigeration Site Ground Water Management Zone, 2/96. P. 303492-303498. The following are attached:

- a) Attachment 1, site location map;
- b) Attachment 2, site layout and monitoring wells;
- c) Attachment 3, VOC concentrations in ground water;
- d) Attachment 4, tax parcel map showing ground water management zone boundaries.

V. COMMUNITY INVOLVEMENT/CONGRESSIONAL CORRESPONDENCE/IMAGERY

1. Newspaper article entitled "McAllister, Wilson say site clean," Smyrna/Clayton Sun, 5/28/86. P. 500001-500001.
2. Newspaper article entitled "Superfund location questioned," Smyrna Times, 2/26/87. P. 500002-500002.
3. Newspaper article entitled "Metal Masters faces EPA in pollution responsibility," Wilmington News Journal, 9/25/90. P. 500003-500004.
4. Letter to Concerned Citizen or Official from Ms. Amy J. Burrage, U.S. EPA, re: Error contained in September 1990 fact sheet, 10/5/90. P. 500005-500005.
5. U.S. EPA Fact Sheet, re: Tyler Refrigeration Site, Smyrna, Delaware, 3/91. P. 500006-500009.
6. EPA Environmental News entitled "EPA Executes a Consent Order with Clark Equipment Company to Conduct Investigations at the Tyler Refrigeration Superfund Site," 4/1/91. P. 500010-500011.
7. U.S. EPA Fact Sheet, re: Tyler Refrigeration Site, Smyrna, Delaware, 9/91. P. 500012-500013.
8. U.S. EPA Public Notice, re: Announcement of a public meeting for the Tyler Refrigeration Superfund Site, (undated). P. 500014-500014.
9. U.S. EPA Fact Sheet, re: Completion of the Remedial Investigation for the Tyler Refrigeration Site, Smyrna, Delaware, 10/93. P. 500015-500016.

BIBLIOGRAPHY OF SITE SPECIFIC GUIDANCE DOCUMENTS

1. Guidance For Conducting Remedial Investigations and Feasibility Studies Under CERCLA, prepared by OSWER/OERR, 10/1/88.
OSWER #9355.3-01
2. CERCLA Compliance With Other Environmental Statutes, prepared by J.W. Porter/OSWER, 10/2/85.
OSWER #9234.0-2
3. CERCLA Compliance With Other Laws Manual (Draft), prepared by OERR, 8/8/88.
OSWER #9234.1-012